

CIRRIFORM CLOUDS

IN a "Note on a Proposed Scheme for the Observation of the Upper Clouds" the Rev. W. Clement Ley has written an abstract of part of a large work on clouds, which he is now preparing for publication. This note has been circulated with a view of obtaining suggestions on the scheme of classification, observation, and telegraphy, which the writer has submitted to his colleagues of the Committee on Cirrus observations, nominated by the International Meteorological Committee in 1882.

The author follows the primary outlines of cloud-classification proposed by Luke Howard, dividing the objects of observation into cirriforms, cumuliforms, stratiforms, and composites; while in the subdivision of these primary types he has been induced by reasons, the cogency of which he hopes to demonstrate, to deviate very considerably from Howard's classification. The true cirriforms, to the discussion of which the note is restricted, are divided by Mr. Ley as follows: cirrus, cirro-filum, cirro-velum (with its variety mammatum), cirro-nebula, and cirro-granum. The author has been, "after many years devoted to the consideration of the subject, reluctantly compelled to give up the employment of the two terms 'cirro-stratus' and 'cirro-cumulus.' Their use has led to endless confusion. In point of structure the clouds usually called cirro-cumuli belong essentially to the higher stratiforms, consisting of nubecules separate, or partly coalescing, occupying a layer of atmosphere of very small vertical thickness, but of very great horizontal extent, and they are not formed in nature by those processes which are productive of clouds either of the cirrus or of the cumulus type. They are not, in fact, either in appearance or in mode of physical formation, either compounds of cirrus with cumulus or hybrids between cirrus and cumulus. Therefore in practice the use of the word cirro-cumulus has led to a large number of clouds of no great elevation being classified among the cirriforms, a result which was of little consequence when the laws regulating the upper currents of the atmosphere had received no examination, but which must be absolutely fatal to a scheme based upon those laws, according to which new and most valuable results will be attained. The name cirro-stratus is almost equally objectionable, and for similar reasons."

Six pages of this note are devoted to instructions on a system of observing and reporting by telegraph the structure and movements of the upper clouds; and the author shows that, if this system be adopted on an extensive scale, results of great practical importance may be anticipated. The indispensable pre-requisite is a clear and scientific classification of clouds according to physical structure.

SCIENTIFIC PROGRESS IN CHINA AND JAPAN

VARIOUS steps in the progress of China and Japan in the adoption of Western science and educational methods have from time to time been noticed in these columns. To the popular mind the names of the two countries are synonymous with rigid unreasoning conservatism and with rapid change respectively. The grave, dignified Chinese, who maintains his own dress and habits even when isolated amongst strangers, and whose motto appears to be, *Stare super vias antiquas*, is popularly believed to be animated by a sullen, obstinate hostility towards any introduction from the West, however plain its value may be; while his gayer and more mercurial neighbour, the Japanese, is regarded as the true child of the old age of the West, following assiduously in its parent's footsteps, and pursuing obediently the path marked out by European experience. There is considerable misconception in this, as indeed there is at all times in the English popular mind with regard to strange

peoples. Broadly speaking, it is no doubt correct to say that Japan has adopted Western inventions and scientific appliances with avidity; that she has shown a desire for change which is abnormal, and a disposition to destroy her charts and sail away into unsurveyed seas, while China remains pretty much where she always was. She is now, with some exceptions, what she was twenty, two hundred, perhaps two thousand years ago, while a new Japan has been created in fifteen years. All this, we say, is true, but it is not the whole truth. China also has had her changes; not indeed so marked or rapid, not so much in the nature of a *volte-face* on all her past as those of her neighbour. The radical difference between the two countries in this respect we take to be this: that while Japan loves change for the sake of change, China dislikes it, and will only adopt it when it is clearly demonstrated to her that change is absolutely necessary. To the Japanese change appears to be a delightful excitement, to the Chinese a distasteful necessity; to the former whatever is must be wrong, to the latter whatever is right. As a consequence of this difference between the two peoples, when China once makes a step forward it is generally after much deliberation, and is never retraced. Japan is constantly undertaking new schemes with little care or thought for the morrow, but with the applause of injudicious foreign friends. In a short time she discovers that she has underrated the expense or exaggerated the results, and her projects are straightway abandoned as rapidly and thoughtlessly as they were commenced. Swift suggested as a suitable subject for a philosophical writer a history of human projects which were never carried out; the historian of modern Japan finds these at every turn. Where, for example, are the results of the great surveys, trigonometrical and others, which were commenced in Yezo and the main island about ten years ago? A large, expensive, but highly competent foreign staff was engaged, and worked for a few years; but suddenly the whole survey department was swept away, and the valuable instruments are, or were recently, lying rusting in a warehouse in Tokio. The same story may be told of scores of other scientific or educational undertakings in Japan. An able and careful writer, Col. H. S. Palmer, R.E., who has recently, with a friendly and sympathetic eye, examined the whole field of recent Japanese progress, in the *British Quarterly Review*, is forced to acknowledge this. "Once having recognised," says this officer, "that progress is essential to welfare, and having resolved, first amongst the nations of the East, to throw off past traditions and mould their civilisation after that of Western countries, it was not in the nature of the lively and impulsive Japanese to advance along the path of reform with the calmness and circumspection that might have been possible to a people of less active temperament. Without doubt many foreign institutions were at first adopted rather too hastily, and the passing difficulties which now beset Japan are to some extent the inevitable result." It would be blindness to deny that the net result of the Japanese efforts is progress of a very remarkable kind, but it is a progress which in many respects lacks the firm and abiding characteristics of Chinese movements.

The proverb, *Chi va piano va sano*, which was recommended ten years ago to Japanese attention by an eminent English official, and apparently disregarded by them, has been adopted by their continental neighbours. To the blandishments of pushing diplomatists or acute promoters, the Chinese are deaf. However we may felicitate ourselves on our inventions, scientific appliances, "the railway and the steamship and the thoughts that shake mankind," our progress, the newspapers, the penny post, and what not, China will not adopt them simply because we have found their value and are proud of them. But if, within the range of her own experience, she finds the advantage of these things, she will employ them with a

rapidity and decision surpassing those of the Japanese. A conspicuous instance of this will be found in her recent action with respect to telegraphs. For years the Chinese steadily refused to have anything to do with them; the small land line which connected the foreign community of Shanghai with the outer world, was maintained against the violent protests of the local authorities, and the cable companies experienced some difficulty in getting permission to land their cables. But during the winter of 1879-80, when war with Russia was threatening, the value of telegraphs was demonstrated to the Peking Government. The Peiho at Tientsin was closed by ice against steamers, and news could only be carried to the capital by overland couriers from Shanghai. Before a year elapsed a land line of telegraph was being constructed between this port and Tientsin; in a few months the line was in working order, and the Chinese metropolis is now in telegraphic communication with every capital in Europe.

This conservatism, respect for antiquity, conceit, prejudice, call it what we will, has something in it that extorts our respect. Let us imagine a dignified and cultivated Chinese official conversing with a pushing Manchester or Birmingham manufacturer, who descants on the benefits of our modern inventions. He would probably commune with himself in this wise, whatever reply Oriental politeness would dictate to his interviewer: "China has got on very well for some tens of centuries without the curious things of which this foreigner speaks; she has produced in that time statesmen, poets, philosophers, soldiers; her people appear to have had their share of affliction, but not more than those of Europe; why should we now turn around at the bidding of a handful of strangers who know little of us or our country, and make violent changes in our life and habits? A railway in a province will throw thousands of coolies and boatmen out of employment, and bring on them misery and starvation. This foreigner says that railways and telegraphs have been found beneficial in his country; good, let his countrymen have them if they please, but let us rest as we are for the present. Moreover, past events have not given us such faith in Europeans that we should take all they say for wisdom and justice." A day will undoubtedly come when China also will have her great mechanical and scientific enterprises; but what we contend for here is that nothing we can say or do will bring that time an hour nearer. European public opinion is to China a dead letter; she refuses to plead before that tribunal. Each step of her advance along our path must be the result of her own reflection and experience; and our wisest policy would be to leave her to herself to advance on it as she deems best.

SINENSIS

PROF. LINDSTRÖM ON OPERCULATE CORALS¹

THE extinct stony corals, the calicles of which are provided with calcareous opercula, have ever been a puzzle to naturalists, since they are almost entirely without parallel amongst existing Anthozoa. The genera and species are not numerous, and are all of Palæozoic age. By far the finest and best preserved specimens of the most important forms are found in the Silurian strata in the Island of Gothland in the Baltic, and are collected for the National Museum at Stockholm, where they come under the care of Prof. Lindström, the author of the present memoir, so justly distinguished for his palæontological researches generally, and especially for those on corals. In this memoir he gives a *résumé* of all the forms of operculate corals as yet known, embodying an immense amount of important new information derived from his own prolonged investigations on a series of most

¹ "Om de Palæozoiska Formationernas Operkelbärande Koraller." Af G. Lindström, Bihang till K. Svenska, Vet. Akad. Handlingar, B. 7, No. 4.

remarkable specimens which I had the advantage of seeing and having explained to me by him in the summer of last year. The whole paper forms a most valuable contribution to our knowledge of these especially interesting and peculiar corals.



FIG. 1.—*Goniophyllum pyramidale* (*mutatio secunda*), viewed from above, with the opercular valves *in situ* of the natural size.

The first operculate coral described was *Goniophyllum pyramidale*, which Bromell in 1729 placed amongst the corals. The best known, and the one concerning which there has been the greatest difference of opinion, is *Calceola sandalina*, which was first figured in 1749 from the collection of Rosinus of Hamburg, by Brüchmann, who pointed out the resemblance of the coral to the front of a woman's slipper.

Brüchmann referred *Calceola* to the corals just as Bromell had *Goniophyllum*, but this was mainly because neither he or other early authors following him were acquainted with the opercula belonging to the specimens. Linné placed *Calceola* with the Mollusca as *Anomia sandalina*. Later it was referred to the Brachiopoda, a position in which a large number of eminent modern authorities retain it. If *Calceola* stood alone, the gravest doubts might certainly be entertained as to its having any relations to the corals; but now that a series of clearly allied forms such as *Goniophyllum* and *Rhizophyllum*, also bearing opercula, have had their structure so fully and satisfactorily worked out as has been done by Prof. Lindström, it is hardly possible not to follow him in placing the whole amongst the Anthozoa. The curious arrangement of the septa in *Calceola* closely resembles that in *Goniophyllum* as regards the septa both in the calicles and on the opercula. It is almost impossible to doubt the Anthozoan nature of *Goniophyllum*, whilst both it and *Rhizophyllum*, which has like *Calceola* an operculum of a single piece only, demonstrate their close relation to numerous recognised Palæozoic corals by exhibiting intracalcinal gemmation, and developing, like many other corals, an abundance of roots.

The author divides the *Anthozoa operculata* into two families—

I. *Calceolidæ* (or *Heterotæchidæ*), distinguished by having the septa on the inner face of the operculum not alike and a median septum the largest.

II. *Aræopomatidæ* (or *Homotæchidæ*), with the septa on the operculum all alike and no defined median septum.

The *Calceolidæ* include all those forms in which the operculum, whether composed of one or four valves, has this valve or valves marked inside with a stout prominent median septum.

The family falls into two groups—the one in which the operculum consists of a single valve containing three genera, namely, the well-known *Calceola*, distinguished by not multiplying by budding, being thus never compound, by having no root-tubes, and not showing vesicular structure internally; and two others—*Rhizophyllum* and *Platyphyllum*—in both of which calcinal gemmation occurs and the internal structure is vesicular, somewhat as in *Cystiphyllum*.

In *Rhizophyllum*, a genus founded by Lindström, the